

1637  
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 00-713-i12)

In re Application of: )  
Chad A. Mirkin, et al. )  
Serial No.: 09/975,376 ) Examiner: Alexander H. Spiegler  
Filed: October 11, 2001 ) Group Art Unit: 1637  
For: NANOPARTICLES HAVING ) Confirmation No. 9821  
OLIGONUCLEOTIDES ATTACHED )  
THERETO AND USES THEREFOR )

**TRANSMITTAL LETTER**

Commissioner for Patents  
P.O. Box 1450  
Commissioner for Patents

Sir:

In regard to the above-identified application, we are transmitting herewith the attached:

1.
  - a. Letter;
  - b. Copy of Information Disclosure Statement with copies of 16 references;
  - c. Copy of Supplemental Information Disclosure Statement with copies of 9 references;
  - d. Copy of Second Supplemental Information Disclosure Statement with copies of 3 references;
  - e. Copy of Third Supplemental Information Disclosure Statement with copies of 5 references;
  - f. Copy of Fourth Supplemental Information Disclosure Statement with copies of 60 references;
  - g. Copy of Fifth Supplemental Information Disclosure Statement with copies of 4 references; and
  - h. Return Receipt Postcard
2. With respect to fees:
  - a) No fees are due at the present time.
  - b) **General Authorization:** Please charge any underpayment or credit any overpayment our Deposit Account. No. 13-2490.
3. CERTIFICATE OF MAILING UNDER 37 CFR § 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described in paragraph 1 hereinabove, are being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 17 day of September, 2004.

Date: Sept. 17, 2004

Respectfully submitted,

  
Emily Miao  
Registration No. 35,285



**PATENT**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**(Case No. 00-713-i12)**

In re Application of: )  
Mirkin et al. ) Examiner: Alexander H. Spiegler  
Application No.: 09/975,376 ) Art Unit: 1637  
Filing Date: October 11, 2001 ) Confirmation No.: 9821  
For: Nanoparticles Having )  
Oligonucleotides Attached Thereto )  
And Uses Therefor )

**LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

As requested by the Examiner in the Office Action dated March 16, 2004, attached please find a third copy of the references that were cited in the Information Disclosure Statement ("IDS"), Supp IDS, 2<sup>nd</sup> Supp IDS, 3<sup>rd</sup> Supp IDS, 4<sup>th</sup> Supp IDS and, 5<sup>th</sup> Supp IDS. An original copy of the references was already sent to the Patent Office as acknowledged in the attached copy of a PTO stamped postcard. Accordingly, no fee is due. A second copy was already sent to the Patent Office with a Letter on January 22, 2003 as acknowledged in the attached copy of the PTO stamped postcard.

Prompt consideration and entry of this Letter and enclosures is respectfully requested.

Respectfully submitted,

By: \_\_\_\_\_

Emily Miao  
Reg. No. 35,285

Date: Sept. 17, 2004  
McDonnell Boehnen Hulbert & Berghoff LLP  
300 South Wacker Drive, 32nd Floor  
Chicago, IL 60606  
Telephone: (312) 913-0001  
Facsimile: (312) 913-0002

Hon. Commissioner of  
Patents and Trademarks

S/N - 09/975,376

Atty EM

Re: Applicant - Chad A. Mirkin, et al.

RECEIVED

Case No. 00-713-i12

**NANOPARTICLES HAVING OLIGONUCLEOTIDES ATTACHED THERETO AND USES THEREFOR**

Sent Via Hand Delivery to Examiner Shar Hashemi, Group Art Unit 1637

03 JAN 2001 11:31

Sir:

Please place the Patent Office receipt stamp hereon and mail to acknowledge receipt of:

- Letter
- Copy of Information Disclosure Statement with copies of 16 references
- Copy of Supplemental Information Disclosure Statement with copies of 9 references
- Copy of Second Supplemental Information Disclosure Statement with copies of 3 references
- Copy of Third Supplemental Information Disclosure Statement with copies of 5 references
- Copy of Fourth Supplemental Information Disclosure Statement with copies of 60 references
- Copy of Fifth Supplemental Information Disclosure Statement with copies of 4 references
- Return Receipt Postcard

**Fee Enclosed**

\$0.00

Respectfully,  
McDonnell Boehnen Hulbert & Berghoff  
Attorney for Applicant

COPY



Hon. Commissioner of  
Patents and Trademarks

S/N - 09/975,376

Atty EM

Re: Applicant - Chad A. Mirkin, et al.

Case No. 00-713-i12

**NANOPARTICLES HAVING OLIGONUCLEOTIDES ATTACHED THERETO AND USES THEREFOR**  
**Via Hand Delivery to Examiner Jezia Riley, Group Art Unit 1656**

Sir:

Please place the Patent Office receipt stamp hereon and mail to acknowledge receipt of:

- Information Disclosure Statement with copies of 16 references
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- Third Supplemental Information Disclosure Statement with copies of 5 references
- Fourth Supplemental Information Disclosure Statement with copies of 60 references
- Fifth Supplemental Information Disclosure Statement with copies of 4 references

Fee Enclosed

\$0.00

Binders I-VIII

Respectfully,  
McDonnell Boehnen Hulbert & Berghoff  
Attorney for Applicant

**COPY**



# COPY

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 00-713-i12)

In re Application of:

Chad A. Mirkin, et al.

Serial No.: 09/975,376

Filed: October 11, 2001

For: NANOPARTICLES HAVING  
OLIGONUCLEOTIDES ATTACHED  
THERETO AND USES THEREFOR

) Examiner: J. Riley

) Art Unit: 1656

) Confirmation No. 9821

**TRANSMITTAL LETTER**

Commissioner for Patents and Trademarks  
Washington, D.C. 20231

Sir:

In regard to the above identified application.

1. We are transmitting herewith the attached:

- a) Information Disclosure Statement copies of 16 references
- b) Supplemental Information Disclosure Statement with copies of 9 references
- c) Second Supplemental Information Disclosure Statement with copies of 3 references
- d) Third Supplemental Information Disclosure Statement with copies of 5 references
- e) Fourth Supplemental Information Disclosure Statement with copies of 60 references
- f) Fifth Supplemental Information Disclosure Statement with copies of 4 references
- g) Return Receipt Postcard

2. With respect to fees:

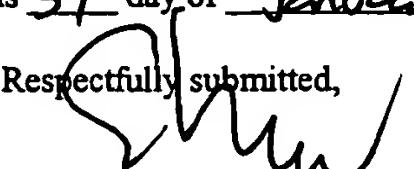
a) No check is attached.

b) **General Authorization:** Please charge any underpayment or credit any overpayment our Deposit Account, No. 13-2490.

3. CERTIFICATE OF MAILING UNDER 37 CFR § 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described in paragraph 1 hereinabove, are being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents and Trademarks, Washington, D.C. 20231 on this 31 day of January, 2002.

Date: 1/31/02

Respectfully submitted,

  
Emily Miao  
Registration No. 35,285



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PATENT

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(Case No. 00-713-i12)

In re Application of:

Chad A. Mirkin, et al.

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THERETO AND USES THEREFOR

) Examiner: Jezia Riley

) Art Unit: 1656

) Confirmation No. 9821

Commissioner for Patents and Trademarks  
Washington, D.C. 20231

INFORMATION DISCLOSURE STATEMENT

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Mroczkowski, et al., U.S. Patent No. 5,284,748, issued 02/08/94.
2. Engelhardt, et al., U.S. Patent No. 5,288,609, issued 02/22/94.
3. Hainfield, et al., U.S. Patent No. 5,360,895, issued 11/01/94.
4. Kidwell, et al., U.S. Patent No. 5,384,265, issued 01/24/95.

---

<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

5. Beebe, et al., U.S. Patent No. 5,472,881, issued 12/05/95.
6. Stimpson, et al., U.S. Patent No. 5,599,668, issued 02/04/97.
7. Kidwell, et al., U.S. Patent No. 5,637,508, issued 06/10/97.
8. Alivisatos, et al., U.S. Patent No. 5,751,018, issued 05/12/98.
9. Hansen, et al., U.S. Patent No. 5,939,021, issued 08/17/99.
10. Weiss, et al., U.S. Patent No. 5,990,479, issued 11/23/99.
11. WO 93/10564 published 27 May 1993.
12. WO 98/10289 published 12 March 1998.
13. WO 99/23258 published 14 May 1999.
14. WO 99/21934 published 06 May 1999.
15. WO 99/20789 published 29 April 1999.
16. O.D. Velev, et al., "In Situ Assembly of Collordal Particles into Miniaturized Biosensors," *Langmuir*, May 25, 1999, Vol. 15, No. 11, pp. 3693-3698 (May 25, 1999)

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to

allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

Respectfully submitted,



Emily Miao  
Registration No. 35,285

Dated:

1/31/02

McDonnell Boehnen Hulbert & Berghoff  
300 South Wacker Drive  
Chicago, Illinois 60606  
Telephone: (312) 913-0001  
Facsimile: (312) 913-0002

Form PTO-1449

U.S. Department of Commerce  
Patent and Trademark Office

Atty Docket No.

Serial No.

00-113-i12

09/975,376

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

COPY



Applicant: Chad A. Mirkin, et al.

Filing Date: 10/11/01

Group: 1656

## U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date
	1.	5,288,609	02/08/94	Mroczkowski, et al.			
	2.	5,284,748	02/22/94	Engelhardt, et al.			
	3.	5,360,895	11/01/94	Hainfield, et al.			
	4.	5,384,265	01/24/95	Kidwell, et al.			
	5.	5,472,881	12/05/95	Beebe, et al.			
	6.	5,599,668	02/04/97	Stimpson, et al.			
	7.	5,637,508	06/10/97	Kidwell, et al.			
	8.	5,751,018	05/12/98	Alivisatos, et al.			
	9.	5,939,021	08/17/99	Hansen, et al.			
	10.	5,990,479	11/23/99	Weiss, et al.			

## FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation Yes No
	11.	WO 93/10564	27 May 93	PCT			
	12.	WO 98/10289	12 March 98	PCT			
	13.	WO 99/23258	14 May 99	PCT			
	14.	WO 99/21934	06 May 99	PCT			
	15.	WO 99/20789	29 April 99	PCT			

## OTHER DOCUMENTS - Including Author, Title, Date, Pertinent Pages, Etc.

16. O.D. Velev, et al., "In Situ Assembly of Collodial Particles into Miniaturized Biosensors," *Langmuir*, Vol. 15, No. 11, pp. 3693-3698, May 25, 1999

Examiner

Date Considered

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with any communication.



# COPY

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 00-713-i12)**

In the Application of: )  
Chad A. Mirkin, et al. )  
Serial No.: 09/975,376 ) Examiner: Jezia Riley  
Filed: October 11, 2001 ) Group Art Unit: 1656  
For: NANOPARTICLES HAVING ) Confirmation No. 9821  
OLIGONUCLEOTIDES ATTACHED )  
THERETO AND USES THEREFOR )

Commissioner for Patents and Trademarks  
Washington, D.C. 20231

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Stimpson, et al., U.S. Patent No. 5,599,668 issued 02/04/97.
2. Weiss, et al., U.S. Patent No. 5,990,479 issued 11/23/99.

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<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

3. Stimpson, et al., "Real-time detection of DNA hybridization and melting on oligonucleotide arrays by using optical wave guides," *Proc. Natl. Acad. Sci.*, Vol. 92, pp. 6379-6383, California Institute of Technology (1995) U.S.
4. Storhoff, et al., "Strategies for Organizing Nanoparticles into Aggregate Structures and Functional Materials," *Journal of Cluster Science*, Vol. 8, No. 2, pp. 179-217, Plenum Publishing Corporation (1997) U.S.
5. Storhoff, et al., "One-Pot Colorimetric Differentiation of Polynucleotides with Single Base Imperfections Using Gold Nanoparticle Probes," *J. Am. Chem. Soc.*, Vol. 120, pp. 1959-1964, American Chemical Society (1998) U.S.
6. Velev, et al., "In Situ Assembly of Colloidal Particles into Miniaturized Biosensors," *Langmuir*, Vol. 15, No. 11, pp. 3693-3698, American Chemical Society (1999) U.S.
7. Zhu, et al., "The First Raman Spectrum of an Organic Monolayer on a High-Temperature Superconductor: Direct Spectroscopic Evidence for a Chemical Interaction between an Amine and Yba<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub>," *J. Am. Chem. Soc.*, Vol. 119, pp. 235-236, American Chemical Society (1997) U.S.
8. Yguerabide, et al., "Light-Scattering Submicroscopic Particles as Highly Fluorescent Analogs and Their Use as Tracer Labels in Clinical and Biological Applications," I. Theory, *Analytical Biochemistry*, Vol. 262, pp. 137-156 (1998) U.S.
9. Yguerabide, et al., "Light-Scattering Submicroscopic Particles as Highly Fluorescent Analogs and Their Use as Tracer Labels in Clinical and Biological Applications," II. Experimental Characterization, *Analytical Biochemistry*, Vol. 262, pp. 157-176 (1998) U.S.

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not

believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

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Early and favorable consideration is earnestly solicited.

Dated:

1/31/02

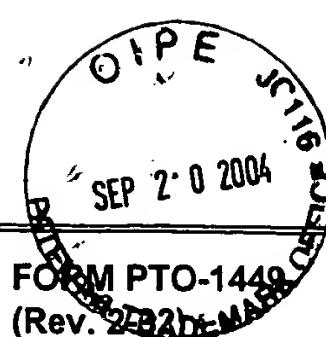
Respectfully submitted,



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Emily Miao  
Registration No. 35,285

McDonnell Boehnen Hulbert & Berghoff  
300 South Wacker Drive, Suite 3200  
Chicago, Illinois 60606  
Telephone: (312) 913-0001  
Facsimile: (312) 913-0002



**COPY**

Sheet 1 of 2

FORM PTO-1449  
(Rev. 2-22-98)

U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No.

00-713-i12

Serial No.

09/975,376

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

**Applicant:**

Chad A. Mirkin, et al.

**Filing Date:**

October 11, 2001

**Group:**

1656

**U.S. PATENT DOCUMENTS**

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	1.	5,599,668	02/04/97	Stimpson, et al.			
	2.	5,990,479	11/23/99	Weiss, et al.			

**FOREIGN PATENT DOCUMENTS**

		Document Number	Date	Country	Class	Subclass	Translation Yes	No

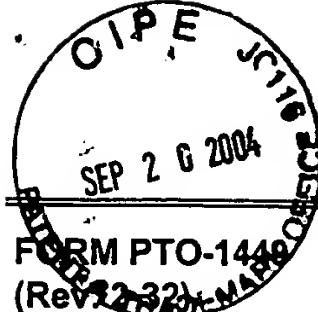
**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.).**

3.	Stimpson, et al., "Real-time detection of DNA hybridization and melting on oligonucleotide arrays by using optical wave guides," <i>Proc. Natl. Acad. Sci.</i> ., Vol. 92, pp. 6379-6383, California Institute of Technology (1995) U.S.
4.	Storhoff, et al., "Strategies for Organizing Nanoparticles into Aggregate Structures and Functional Materials," <i>Journal of Cluster Science</i> , Vol. 8, No. 2, pp. 179-217, Plenum Publishing Corporation (1997) U.S.
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6.	Velev, et al., "In Situ Assembly of Colloidal Particles into Miniaturized Biosensors," <i>Langmuir</i> , Vol. 15, No. 11, pp. 3693-3698, American Chemical Society (1999) U.S.
7.	Zhu, et al., "The First Raman Spectrum of an Organic Monolayer on a High-Temperature Superconductor: Direct Spectroscopic Evidence for a Chemical Interaction between an Amine and Yba <sub>2</sub> Cu <sub>3</sub> O <sub>7-δ</sub> ," <i>J. Am. Chem. Soc.</i> , Vol. 119, pp. 235-236, American Chemical Society (1997) U.S.

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

FORM PTO-1440  
(Rev 12-32)U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No.

00-713-i12

Serial No.

09/975,376

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(Use several sheets if necessary)

## Applicant:

Chad A. Mirkin, et al.

Filing Date:

October 11, 2001

Group:

1656

## U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

## FOREIGN PATENT DOCUMENTS

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## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

8.	Yguerabide, et al., "Light-Scattering Submicroscopic Particles as Highly Fluorescent Analogs and Their Use as Tracer Labels in Clinical and Biological Applications," I. Theory, <i>Analytical Biochemistry</i> , Vol. 262, pp. 137-156 (1998) U.S.
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EXAMINER

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Serial No.: 09/975,376

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For: NANOPARTICLES HAVING  
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THERETO AND USES THEREFOR

) Examiner: Jezia Riley

) Group Art Unit: 1656

) Confirmation No. 9821

Commissioner for Patents and Trademarks  
Washington, D.C. 20231

**SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

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1. Natan, U.S. Patent No. 5,609,907, issued March 11, 1997.
2. Natan, U.S. Patent No. 6,025,202, issued February 15, 2000.
3. Natan, et al., U.S. Patent No. 6,149,868, issued November 21, 2000.

---

<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

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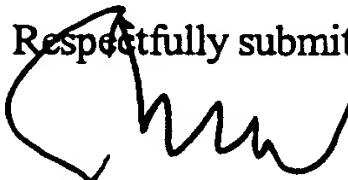
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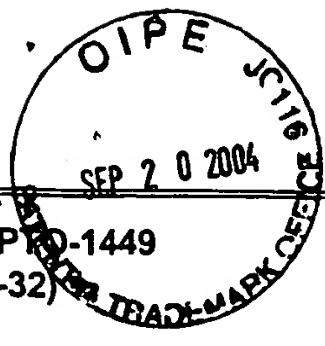
Dated:

1/31/02

Respectfully submitted,

  
Emily Miao  
Registration No. 35,285

McDonnell Boehnen Hulbert & Berghoff  
300 South Wacker Drive, Suite 3200  
Chicago, Illinois 60606  
Telephone: (312) 913-0001  
Facsimile: (312) 913-0002



FORM PRO-1449  
(Rev. 2-32)

U.S. Department of Commerce  
Patent and Trademark Office

Sheet 1 of 1

Atty. Docket No.

00-713-i12

Serial No.

09/975,376

**COPY**

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

**Applicant:**

Chad A. Mirkin, et al.

**Filing Date:**

October 11, 2001

**Group:**

1656

**U.S. PATENT DOCUMENTS**

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
1.		5,609,907	03/11/97	Natan			
2.		6,025,202	02/15/00	Natan			
3.		6,149,868	11/21/00	Natan, et al.			

**FOREIGN PATENT DOCUMENTS**

		Document Number	Date	Country	Class	Subclass	Translation Yes No

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.).**


EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.



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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 00-713-i12)

In the Application of:

Chad A. Mirkin, et al.

Serial No.: 09/975,376

Filed: October 11, 2001

For: NANOPARTICLES HAVING  
OLIGONUCLEOTIDES ATTACHED  
THERETO AND USES THEREFOR

)  
)  
) Examiner: Jezia Riley

) Group Art Unit: 1656

) Confirmation No. 9821

Commissioner for Patents and Trademarks  
Washington, D.C. 20231

**THIRD SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Brada, et al., "Golden Blot" – Detection of Polyclonal and Monoclonal Antibodies Bound to Antigens on Nitrocellulose by Protein A-Gold Complexes, *Analytical Biochemistry*, Vol. 42, pp. 79-83 (1984) U.S.

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<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

2. Dunn, et al., "A Novel Method to Map Transcripts: Evidence for homology between an Adenovirus mRNA and Discrete Multiple Regions of the Viral Genome, *Cell*, Vol. 12, pp. 23-36, (1997) U.S.
3. Hacker, "High performance Nanogold – Silver in situ hybridisation, *Eur. J. Histochem*, Vol. 42, pp. 111-120 (1998) U.S.
4. Ranki, et al., "Sandwich hybridization as a convenient method for the detection of nucleic acids in crude samples," *Gene*, Vol. 21, pp. 77-85 (1983) U.S.
5. Romano, et al., "An antiglobulin reagent labelled with colloidal gold for use in electron microscopy," *Immunochemistry*, Vol. 11, pp. 521-522 (1974) Great Britain

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each

search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

Respectfully submitted,



Emily Miao  
Registration No. 35,285

Dated: 1/31/02

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Sheet 1 of 1

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INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

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Serial No.

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Applicant:

Chad A. Mirkin, et al.

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2. Zuk et al., U.S. Patent No. 4,256,834 issued 03/17/81
3. Ullman et al., U.S. Patent No. 4,261,968 issued 04/14/81
4. Leuvering, U.S. Patent No. 4,313,734 issued 02/02/82
5. Litman et al., U.S. Patent No. 4,318,707 issued 03/09/82

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6. Liu et al., U.S. Patent No. 4,650,770 issued 03/17/87
7. Ullman, U.S. Patent No. 4,713,348 issued 12/15/87
8. Olsen et al., U.S. Patent No. 4,853,335 issued 08/01/89
9. Kura et al., U.S. Patent No. 4,868,104 issued 09/19/89
10. Henkens et al., U.S. Patent No. 5,225,064 issued 07/06/93
11. Shigekawa et al., U.S. Patent No. 5,294,369 issued 03/15/94
12. Shigekawa et al., U.S. Patent No. 5,384,073 issued 01/24/95
13. Kidwell et al., U.S. Patent No. 5,384,265 issued 01/24/95
14. Kossovsky et al., U.S. Patent No. 5,460,831 issued 10/24/95
15. Beebe et al., U.S. Patent No. 5,472,881 issued 12/05/95
16. Brooks, Jr. et al., U.S. Patent No. 5,514,602 issued 05/07/96
17. Hainfeld et al., U.S. Patent No. 5,521,289 issued 05/28/96
18. Gref et al., U.S. Patent No. 5,543,158 issued 08/06/96
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20. Kaushch et al., U.S. Patent No. 5,665,582 issued 09/09/97
21. Letsinger et al., U.S. Patent No. 5,681,943 issued 10/28/97
22. International Patent No. WO 89/06801 published 07/27/89
23. International Patent No. WO 97/40181 published 10/30/97
24. International Patent No. WO 98/04740 published 02/05/98
25. International Patent No. WO 99/23258 published 05/14/99
26. European Patent 0 630 974 A2 published 06/21/94
27. European Patent 0 667 398 A2 published 08/16/95
28. Alivisatos et al., "Organization of 'nanocrystal molecules' using DNA," *Nature*, Vol. 382, pp. 609-611 (1996)

29. Bain, et al., "Modeling Organic Surfaces with Self-Assembled Monolayers," *Angew. Chem. Int. Ed. Engl.*, Vol. 28, pp. 506-512 (1989)
30. Bradley, "The Chemistry of Transition Metal Colloids," *Clusters and Colloids: From Theory to Applications*, G. Schmid, Editor, BCH, Weinheim, New York, pp. 459-542 (1994)
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33. Chen & Seeman, "Synthesis from DNA of a molecule with the connectivity of a cube," *Nature*, Vol. 350, pp. 631-633 (1991)
34. Chen et al., "Crystal Structure of a Four-Stranded Intercalated DNA: d(C<sub>4</sub>)<sup>†‡</sup> *Biochem.*, Vol. 33, pp. 13540-13546 (1994)
35. Dagani, "Supramolecular Assemblies DNA to organize gold nanoparticles," *Chemical & Engineering News*, p. 6-7, August 19, 1996
36. Dubois & Nuzzo, "Synthesis, Structure, and Properties of Model Organic Surfaces," *Annu. Rev. Phys. Chem.*, Vol. 43, pp. 437-464 (1992)
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40. Jacoby, "Nanoparticles change color on binding to nucleotide target," *Chemical & Engineering News*, p. 10, August 25, 1997
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43. Marsh et al., "A new DNA nanostructure, the G-wire, imaged by scanning probe microscopy," *Nucleic Acids Res.*, Vol. 23, pp. 696-700 (1995)
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47. Mucic et al., "Synthesis and characterizations of DNA with ferrocenyl groups attached to their 5'-termini: electrochemical characterization of a redox-active nucleotide monolayer," *Chem. Commun.*, pp. 555-557 (1996)
48. Mulvaney, "Surface Plasmon Spectroscopy of Nanosized Metal Particles," *Langmuir*, Vol. 12, pp. 788-800 (1996)
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52. Shaw & Wang, "Knotting of a DNA Chain During Ring Closure," *Science*, Vol. 260, pp. 533-536 (1993)
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60. Zhang et al., "Informational Liposomes: Complexes Derived from Cholesteryl-conjugated Oligonucleotides and Liposomes," *Tetrahedron Lett.*, Vol. 37, pp. 6243-6246 (1996)

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Early and favorable consideration is earnestly solicited.

Respectfully submitted,



---

Emily Miao  
Registration No. 35,285

Dated: 1/31/02

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Chicago, Illinois 60606  
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Sheet 1 of 4

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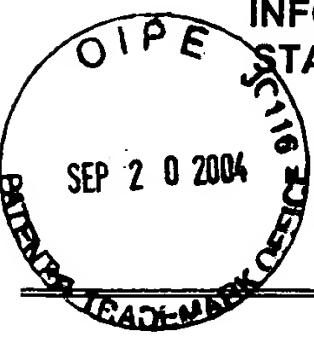
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Serial No.

00-713-i12

09/975,376

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**



Applicant: Chad A. Mirkin, et al.

Filing Date: 10/11/01

Group: 1656

**U.S. PATENT DOCUMENTS**

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date
1.		4,193,983	3/18/80	Ullman et al.			
2.		4,256,834	3/17/81	Zuk et al.			
3.		4,261,968	4/14/81	Ullman et al.			
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**OTHER DOCUMENTS - Including Author, Title, Date, Pertinent Pages, Etc.**

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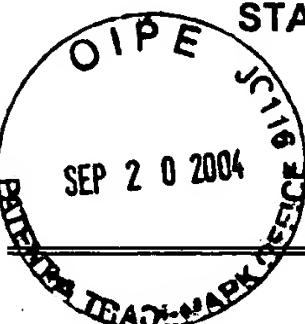
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22.	WO 89/06801	7/27/89	PCT				
23.	WO 97/40181	10/30/97	PCT				
24.	WO 98/04740	2/5/98	PCT				
25.	WO 99/23258	10/30/98	PCT				
26.	0 630 974 A2	06/21/94	EPO				
27.	0 667 398 A2	8/16/95	EPO				

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47.	Mucic et al., "Synthesis and characterizations of DNA with ferrocenyl groups attached to their 5'-termini: electrochemical characterization of a redox-active nucleotide monolayer," <i>Chem. Commun.</i> , pp. 555-557 (1996)
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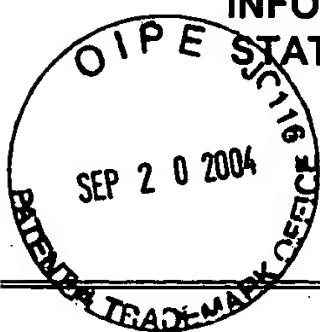
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	53.	Shekhtman et al., "Stereostructure of replicative DNA catenanes from eukaryotic cells," <i>New J. Chem.</i> Vol. 17, pp. 757-763 (1993)
*	54.	Smith and Feigon, "Quadruplex structure of Oxytricha telomeric DNA oligonucleotides," <i>Nature</i> , Vol. 356, pp. 164-168 (1992)
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	56.	Wang et al., "Assembly and Characterization of Five-Arm and Six-Arm DNA Brached Junctions," <i>Biochem.</i> , Vol. 30, pp. 5667-5674 (1991)
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	58.	Weisbecker et al., "Molecular Self-Assembly of Aliphatic Thiols on Gold Colloids," <i>Langmuir</i> , Vol. 12, pp. 3763-3772 (1996)
	59.	Wells, "Unusual DNA Structures," <i>J. Biol. Chem.</i> , Vol. 263, pp. 1095-1098 (1988)
	60.	Zhang et al., "Informational Liposomes: Complexes Derived from Cholestryl-conjugated Oligonucleotides and Liposomes," <i>Tetrahedron Lett.</i> , Vol. 37, pp. 6243-6246 (1996)

Examiner

Date Considered



COPY

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 00-713-i12)

In re Application of:

Chad A. Mirkin, et al.

Serial No. 09/975,376

Examiner: Jezia Riley

Filed: October 11, 2001

Art Unit: 1656

For: Nanoparticles Having Oligonucleotides  
Attached Thereto and Uses Therefor

Confirmation No. 9821

Commissioner for Patents and Trademarks  
Washington, D.C. 20231

**FIFTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. WO 92/04469 published 19 March 1992

2 WO 90/02205 published 8 March 1990

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<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

3. Borman, *Chem. Eng. News*, December 9, 1996, pp. 42-43 (1996)

4. Tomlinson et al. *Anal Biochem*, Vol. 171, pp. 217-222 (1998)

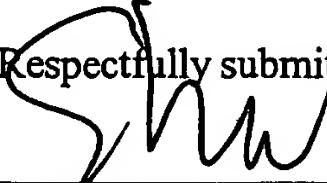
In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

1 | 3 | 6 ✓

Dated: \_\_\_\_\_

Respectfully submitted,  


Emily Miao  
Registration No. 35,285

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Form PTO-1449

U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No  
OD-713-i12

**Serial No.**  
**09/975,376**



## **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

Atty. Docket No  
00-7134-2

**Applicant: MIRKIN et al.**

Filing Date: 10/11/01

Group: 1656

## **U.S. PATENT DOCUMENTS**

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date

## **FOREIGN PATENT DOCUMENTS**

		<b>Document Number</b>	<b>Date</b>	<b>Country</b>	<b>Class</b>	<b>Subclass</b>	<b>Translation</b>	
							<u>Yes</u>	<u>No</u>
	1.	WO 92/04469	19 March 1992	PCT				X
	2.	WO 90/02205	8 March 1990	PCT				X

**OTHER DOCUMENTS - Including Author, Title, Date, Pertinent Pages, Etc.**

<b>Examiner</b>	<b>Date Considered</b>
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**EXAMINER:** Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with any communication.